

The Relationship Between Seblak Consumption Habits and Debris Index Scores Among Students at ITKES Muhammadiyah, Sidenreng Rappang Regency, South Sulawesi Province

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Abstract: Dietary patterns are one of the factors that play a role in influencing oral health. Seblak is a food that is very popular among college students because of its distinctive flavor and high carbohydrate content. The tendency of seblak to adhere easily to the surface of teeth is thought to increase debris accumulation if not balanced by optimal oral hygiene practices. This study aims to analyze the relationship between seblak consumption habits and debris index scores among students at ITKES Muhammadiyah in Sidenreng Rappang Regency, South Sulawesi Province. The study design was an analytical observational study using a cross-sectional approach. A sample of 35 students was selected using purposive sampling based on predetermined criteria. Data on seblak consumption habits were collected via a questionnaire, while debris index scores were measured using the Simplified Debris Index (DI-S) assessment. The research data were then analyzed using the chi-square test with a significance level (α) of 0.05. The results of the analysis show that the majority of respondents were classified as having moderate seblak consumption habits (48.6%), while the debris index values were predominantly in the poor category (57.1%). Based on the results of statistical testing, there is a significant relationship between seblak consumption habits and the debris index score (value = 40.860; df = 4; $p < 0.000$). It is concluded that the higher the seblak consumption habits, the greater the tendency for an increase in the debris index score among college students.

Keywords: Seblak Consumption; Debris Index; Oral Hygiene; University Students; DI-S.

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I. INTRODUCTION

Oral health is closely linked to overall health and plays a role as one of the determinants that can influence an individual's quality of life. To date, oral health problems—particularly dental caries and periodontal disease—remain a challenge in efforts to improve health outcomes, and are widely prevalent globally. Various factors contribute to the incidence of these diseases, one of which is individual behavior related to oral health maintenance, including dietary habits and oral hygiene.

Oral hygiene behaviors are a series of individual actions aimed at maintaining a healthy oral cavity and preventing dental health problems; those established in young adulthood play a crucial role in determining oral health status

in later life. College students are a group vulnerable to lifestyle changes, including dietary patterns, the frequency of snacking, and irregular oral hygiene practices; consequently, they are at risk of increased plaque and debris accumulation if these changes are not balanced by good oral health maintenance behaviors (Fidan & Fidan, 2026). According to the WHO (2025), the accumulation of debris on the tooth surface—which reflects the buildup of food debris and organic matter adhering to the hard tissues of the teeth—is an indicator of poor oral hygiene, as it can serve as a breeding ground for bacteria that cause dental caries and periodontal disease (WHO, 2025).

At the national level, the results of the 2023 Indonesian Health Survey (SKI) revealed that nearly 57% of Indonesia's population was found to have oral health problems

(Kementerian Kesehatan RI, 2024). This high prevalence is linked to suboptimal oral hygiene practices; although 72% of the population has made a habit of brushing their teeth daily, only 6.2% are known to do so using the correct technique, meaning that improper brushing habits contribute to the incidence of dental and oral diseases among the Indonesian population. (Kementerian Kesehatan RI, 2024).

The debris index is one of the components of the Oral Hygiene Index Simplified (OHI-S), which is widely used in epidemiological studies of oral health to assess the accumulation of soft food debris and plaque on tooth surfaces based on a 0–3 scoring system across six index tooth surfaces (Greene & Vermillion, 1964). Debris accumulation is influenced not only by suboptimal oral hygiene but also by the interaction between dietary habits, the characteristics of the foods consumed, the frequency of exposure to fermentable carbohydrates, and oral health maintenance behaviors (Chapple et al., 2017). Frequently consumed foods containing easily fermentable carbohydrates and having a texture that adheres to tooth surfaces can accelerate biofilm formation, thereby increasing the risk of debris accumulation if not promptly cleaned (Fidan & Fidan, 2026). A high debris index is generally associated with the consumption of foods high in fermentable carbohydrates, as these carbohydrates serve as the primary substrate utilized by cariogenic bacteria, such as *Streptococcus mutans*, for metabolism and the production of organic acids through glycolysis, thereby lowering the pH of dental plaque below a critical level and triggering enamel demineralization (Moynihan & Petersen, 2004). In addition to their carbohydrate content, the chewy texture and thick sauce of these foods also slow down the natural cleansing of food debris by saliva, thereby increasing the risk of debris accumulation on the tooth surface (Atkinson et al., 2021). Consistent with this, a study of adolescent girls in Indonesia found that the habit of consuming foods high in carbohydrates and sugar was significantly associated with poor oral hygiene status as measured by the OHI-S (Mahriani et al., 2022). Seblak, a traditional snack made from crackers, noodles, and macaroni with spicy and savory seasoning, is becoming increasingly popular among urban college students because it is affordable and easily accessible; however, its content of rapidly soluble carbohydrates and sticky texture have the potential to increase debris accumulation if not balanced by good oral hygiene (Setyawan, 2025). Various studies have examined the relationship between oral health maintenance habits, dietary patterns, and oral health status among college students. However, most studies still focus on toothbrushing behavior, attitudes toward oral health, or the incidence of caries and the DMFT index, whereas studies specifically evaluating the relationship between the consumption of traditional Indonesian foods with high levels of fermentable carbohydrates and a sticky texture—such as seblak—and the Simplified Debris Index (DI-S) have not been widely conducted; consequently, the availability of scientific data in this field remains limited. Based on this, the present study aims to fill this knowledge gap by providing scientific evidence regarding the relationship between seblak consumption habits and the Simplified Debris Index (DI-S) among Indonesian college students (Fidan & Fidan, 2026; Mahriani et al., 2022).

At the local level, South Sulawesi Province continues to face a high prevalence of oral health problems, with dental caries being one of the most common issues and low rates of proper toothbrushing among certain subpopulations (Pariati et al., 2023). More specifically, the prevalence of dental and oral health problems in Sidenreng Rappang Regency is estimated at around 64.8%, with dental care coverage remaining low, while local research on the relationship between the consumption of traditional snacks and indicators of oral health in the local population remains limited (Arsad et al., 2024). These conditions highlight the need for locally evidence-based preventive interventions, particularly those examining the impact of popular snacking habits—such as seblak—on oral hygiene among college students in this region.

Based on the above discussion, it is important to conduct research on the relationship between seblak consumption habits and debris index scores among students at ITKES Muhammadiyah in Sidenreng Rappang Regency, given the limited number of similar studies and the relevance of this research as a basis for developing oral health education programs and preventive interventions on campus. This study aims to analyze the relationship between seblak consumption habits and debris index scores among students at ITKES Muhammadiyah Sidenreng Rappang. Additionally, this study was conducted to obtain information regarding debris index scores among students and to analyze the relationship between seblak consumption habits and these scores.

II. METHODS

This study employed a quantitative method with an analytical observational design and a cross-sectional approach to analyze the relationship between seblak consumption habits and the Simplified Debris Index (DI-S) scores among students at ITKES Muhammadiyah in Sidenreng Rappang Regency. The study was conducted on the campus of ITKES Muhammadiyah in Sidenreng Rappang Regency in June 2026 after obtaining research approval. The study population consisted of all 1,044 active students from the 2022–2025 cohorts; 35 respondents were selected as the study sample using purposive sampling based on predetermined inclusion and exclusion criteria. The inclusion criteria for this study included active students who expressed their willingness to participate as respondents, had previously consumed seblak, and did not have any systemic diseases that affect oral hygiene. The exclusion criteria included graduate/non-regular students, students currently undergoing intensive dental and oral care, and those who did not fully complete the questionnaire or observation sheet. The tools and materials used included a questionnaire on seblak consumption habits consisting of 11 statements modified from Indra Fauzi (2016), a Debris Index Simplified (DI-S) observation sheet based on the method by Greene and Vermillion, a diagnostic set consisting of a mouth mirror, a probe, personal protective equipment (PPE) such as masks and gloves, a disposable tray, cotton swabs, tissues, hand sanitizer, writing utensils, and a form for recording examination results.

Data collection was conducted through a field research approach by distributing questionnaires directly to

respondents who met the predetermined study criteria, followed by a clinical examination of oral hygiene status using the Simplified Debris Index (DI-S) method, which involved examining six predetermined index teeth. Primary data in this study were obtained directly from respondents through the distribution of questionnaires as data collection instruments, as well as from the results of clinical examinations. Secondary data were obtained by reviewing various relevant literature sources, including reference books, scientific journal articles, and other supporting documents related to the research focus. The research data were analyzed using the Statistical Package for the Social Sciences (SPSS) software through several data processing steps, including data completeness checks (editing), assigning codes to each variable (coding), data entry, and data cleaning. Next, univariate analysis was used to describe the characteristics of the respondents, the level of seblak consumption habits, and the debris index values, which were presented in the form of frequency distribution tables and percentages. The relationship between seblak consumption habits and debris index values was analyzed using a

significance level of $\alpha = 0.05$. The research results are presented in tables accompanied by descriptive explanations to facilitate the understanding and interpretation of the findings. Furthermore, this study was conducted in accordance with the principles of research ethics, namely by obtaining informed consent from respondents after providing them with adequate explanations, maintaining respondent anonymity, ensuring the confidentiality of information, and adhering to the principle of nonmaleficence.

III. RESULTS

This study was conducted with 35 college students as respondents who met the inclusion and exclusion criteria. The Presentation of the research results includes a description of the respondents' characteristics in the form of distributions, the distribution of research variables, and the results of the analysis testing the relationship between seblak consumption habits and the debris index score.

Table 1 Characteristics of Respondents by Gender

Gender	Frequency (n)	Percentage (%)
Male	2	5,7
Female	33	94,3
Total	35	100

Source: Primary Data, 2026

The data in Table 1 show that the majority of respondents were women, totaling 33 (94.3%), while male respondents numbered only 2 (5.7%).

Table 2 Characteristics of Respondents by Age

Age (Years)	Frequency (n)	Percentage (%)
18	3	8,6
19	7	20,0
20	8	22,9
21	6	17,1
22	7	20,0
23	2	5,7
28	1	2,9
39	1	2,9
Total	35	100

Source: Primary Data, 2026

Based on Table 2, the characteristics of the respondents by age show that, out of a total of 35 respondents, the 20-year-old age group was the most dominant, comprising 8 people (22.9%). There were 7 respondents aged 19 and 22,

respectively (20.0% each), while 6 respondents were 21 years old (17.1%). There were 3 respondents aged 18 (8.6%), 2 aged 23 (5.7%), and 1 each aged 28 and 39 (2.9%).

Table 3 Distribution of Seblak Consumption Habits

Category	Frequency (n)	Percentage (%)
Low	3	8,6
Medium	17	48,6
High	15	42,9
Total	35	100

Source: Primary Data, 2026

The data in Table 3 show that the respondents' seblak consumption habits were predominantly in the moderate category, with 17 respondents (48.6%). The high category

included 15 respondents (42.9%), while the low category consisted of only 3 respondents (8.6%), making it the category with the smallest proportion.

Table 4 Distribution of Debris Index Values

DI-S Category	Frequency (n)	Percentage (%)
Good	2	5,7
Fair	13	37,1
Poor	20	57,1
Total	35	100

Source: Primary Data, 2026

The results of the analysis in Table 4 show that the majority of the 35 respondents had a debris index score in the “poor” category, namely 20 people (57.1%). The “moderate”

category was assigned to 13 respondents (37.1%), while the “good” category was assigned to only 2 respondents (5.7%), making it the category with the lowest proportion.

Table 5 Results of the Chi-Square Test

Variabel	Value	Df	p-value (Sig.)	Notes
Seblak Consumption Habits Based on Debris Index Values	40,860	4	0,000	There is a significant relationship between the two variables under study ($p < 0.05$).

Source: Primary Data, 2026

Based on the results of the analysis using the chi-square test, a Pearson chi-square value of 40.860 was obtained, with 4 degrees of freedom (df) and a significance level of 0.000 ($p < 0.05$). These findings indicate that there is a significant association between seblak consumption habits and debris index scores among students at ITKES Muhammadiyah in Sidenreng Rappang Regency.

IV. DISCUSSION

Based on the research findings, seblak consumption habits were found to have a significant association with debris index scores among students at ITKES Muhammadiyah in Sidenreng Rappang Regency. This association indicates that dietary patterns can contribute to oral hygiene (Guo et al., 2022). Seblak consumption among the students in this study showed a significant association with Debris Index (DI-S) scores, consistent with the concept that the cariogenicity of a food is not solely determined by sweetness but by the total content of fermentable carbohydrates, including processed starch found in crackers and noodles—the main ingredients of seblak (Lingstrom et al., 2000). Seblak is a dish dominated by carbohydrate-rich ingredients such as crackers, noodles, and macaroni, which contain fermentable carbohydrates. In addition to its nutritional content, college students' fast-food consumption habits are also influenced by taste, ease of access, relatively affordable prices, and environmental exposure Kavimalar and Gudadinni (2023) reported that college students prefer fast food because of its taste, ease of access, and the influence of advertising, making the consumption of such foods a part of their daily diet (Kavimalar & Gudadinni, 2023). This statement is supported by recent research indicating that dietary patterns—particularly those high in carbohydrates and sugar—are linked to oral health. Furthermore, frequent consumption of cariogenic foods can increase plaque formation through the activity of oral bacteria, especially when not balanced by good oral hygiene habits (Mandini et al., 2024). These types of carbohydrates are easily utilized by oral bacteria as a substrate for acid production, thereby accelerating plaque formation and increasing debris accumulation if food debris is not promptly removed. Furthermore, the sticky texture of seblak causes food particles

to adhere more easily to tooth surfaces compared to fibrous foods, potentially increasing the debris index. (Greene & Vermillion, 1964; Moynihan & Petersen, 2004)

The findings of this study reinforce the concept that the habit of consuming cariogenic foods is associated with oral hygiene. However, the association found was moderate, suggesting that the habit of consuming seblak is not the sole factor determining the debris index value. Oral hygiene is also influenced by the frequency and technique of toothbrushing, the habit of rinsing the mouth after meals, saliva production, the use of fluoride toothpaste, and overall oral health maintenance behaviors. Thus, an increase in the debris index value results from the interaction of various behavioral factors, not solely from the consumption of seblak (Karadağ et al., 2025). These findings indicate that dietary habits should be considered as one of the determinants in a model of oral health behavior, interacting with oral hygiene habits, lifestyle, and other individual factors. Based on this, strategies to improve oral health must be comprehensive and not merely focused on dietary changes; they must also include interventions targeting overall oral hygiene practices. (Olmos-valverde et al., 2022)

The results of this study are consistent with the findings reported in a previous study by Mahriani et al. (2022) which found that consumption of foods high in carbohydrates and sugar is associated with poor oral hygiene. The results of this study indicate that foods easily fermented by bacteria may contribute to increased plaque formation on tooth surfaces, particularly among individuals who do not pay sufficient attention to oral hygiene practices. These findings align with those of a previous study by Pariati et al. (2023) which stated that the consumption of cariogenic foods and poor oral hygiene practices are factors associated with increased debris accumulation on tooth surfaces. These consistent results indicate that dietary patterns remain a key determinant in maintaining oral hygiene.

Respondents who, despite having a habit of consuming cariogenic foods, still brush their teeth using the proper technique and at the recommended times play a crucial role in maintaining optimal oral hygiene. Conversely, individuals

who consume cariogenic foods less frequently may still have a poor debris index if they do not maintain optimal oral hygiene. This finding suggests that the habit of consuming seblak should be considered a risk factor that interacts with other behavioral factors in determining oral hygiene. On the other hand, several studies indicate that dietary habits are not always the dominant factor influencing oral hygiene, as they are influenced by individual health behaviors. Behaviors such as the frequency of toothbrushing, the use of oral hygiene aids, and adherence to routine dental care can moderate the influence of dietary patterns on oral health status. (Prihastuti et al., 2025)

College students belong to the young adult group, which tends to experience changes in dietary patterns as a result of academic demands, social influences, and their lifestyle. These conditions can affect both dietary behavior and oral hygiene habits. Therefore, promoting oral health in the college setting is crucial for raising students' awareness of adopting healthy eating patterns and consistently practicing good oral hygiene (Alam et al., 2022). Various studies have reported that the implementation of behavior theory-based educational interventions among college students has a positive impact on improving oral hygiene behaviors and several oral health outcomes. These findings indicate that college students represent a potential target group for structured oral health promotion programs within the college setting. (Prihastuti et al., 2025)

The findings of this study indicate that the habit of consuming seblak is associated with the debris index score among college students. It is hoped that the results of this study can serve as input for institutions in enhancing efforts to educate and promote oral health, particularly regarding dietary habits that increase the risk of a high debris index, as well as the importance of maintaining oral hygiene through proper toothbrushing, rinsing after meals, and regular dental checkups as preventive measures to minimize the risk of oral health problems. An intervention study involving college students also supports these findings, demonstrating that the implementation of behavior-based education can improve oral hygiene practices and enhance several oral health outcomes. High Debris Index scores among respondents who consumed seblak more frequently indicate the accumulation of plaque and food debris in the early stages, which, if not counterbalanced by good oral hygiene, has the potential to develop into dental caries (Elia et al., 2023). Therefore, the development of structured educational programs in higher education settings has the potential to serve as an effective preventive measure for improving students' oral health. (Prihastuti et al., 2025)

V. CONCLUSION

Based on the results of a study analyzing the relationship between seblak consumption habits and debris index scores among students at ITKES Muhammadiyah Sidrap, it can be concluded that students' seblak consumption habits generally fall into the moderate category. These findings indicate that seblak is still consumed quite frequently among students as a popular food item, although the frequency of consumption

varies from person to person. The debris index scores of students at ITKES Muhammadiyah Sidrap were mostly in the poor category. This condition indicates that oral hygiene among students remains an aspect that requires attention, given the continued presence of debris accumulation on tooth surfaces. This debris buildup can be a factor that increases the risk of dental and oral health problems if not balanced by the practice of good oral hygiene habits. The results of this study indicate that the habit of consuming seblak is associated with debris index scores among students at ITKES Muhammadiyah Sidrap. The more frequently students consume seblak, the worse their oral hygiene tends to be. Therefore, the habit of consuming foods that may leave residue on the surface of the teeth needs to be balanced by establishing a routine of regular and consistent oral hygiene—an important step in maintaining oral health.

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